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Evaluation of the Gould Incorporated NOx Catalyst

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Gould Incorporated has had a long-term development program in the area of NOx catalysts. Because their catalyst has demonstrated potential for good NOx control, a test program on a low mileage vehicle was undertaken by the Test and Evaluation Branch.

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Emission Control Technology Division
Office of Air and Water Programs
Environmental Protection Agency

Background

Gould Incorporated has had a long-term development program in the area of NOx catalysts. Because their catalyst has demonstrated potential for good NOx control, a test program on a low mileage vehicle was undertaken by the Test and Evaluation Branch of the Emission Control Technology Division.

Device Description

The emission control system was installed on a 1972 Ford Gran Torino with a 351 CID engine. The emission control system included:

a) One Englehard PTX-4237 catalyst per cylinder bank

b) One Gould NOx catalytic reactor (composed of nickel/copper on a metallic monolith) per cylinder bank

c) Quick warm-up provisions which included 10° spark retard during the first 45 seconds of operation, and exhaust port air injection during the first 2 minutes of operation.

The attached Figure shows the catalyst and air delivery system. As illustrated here, the warm-up exhaust port air injection was controlled by a timed solenoid valve. Although Gould's catalyst is a reducing catalyst, a small amount of air is always delivered before their catalyst with the majority being delivered between the Gould catalyst and Englehard catalyst. It should be noted that this system is sensitive to fuel/air ratio, and that the carburetor was set to provide for 2.5% to 3.0% CO in the exhaust at idle, 30, and 50 mph level road load.

Test Program

A 1972 Ford Gran Torino with a 351 CID engine and the emission control system described above was tested. Two tests were conducted in accordance with the 1975 Federal Test Procedure (FTP) as described in the November 15, 1972, Federal Register.

Results

The results from this testing are reported in the attached table. The difference observed in emission levels between tests is attributed to the difference in inertia as tested, and to hard starting encountered during the first test. It is clear that at low mileage the Gould system with their NOx catalyst has the potential of meeting 1976 standards with very good NOx control.

Conclusion

At low mileage the Gould system with their NOx catalyst demonstrated the potential of meeting statutory 1976 standards with very good NOx control.

1975 FTP Test Results

(grams per mile)

Comment	Test #	HC	CO	CO_2	NOx	MPG Fuel Consumption
Inertia 4500#	1	0.45	3.65	964.47	0.05	9.14
Inertia 4000#	2	0.27	2.18	962.29	0.13	9.21
'76 statutory standards		0.4	3.4	---	0.40	---

GOULD CAR CATALYST SYSTEM